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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,374	09/11/2000	Dietrich Haarer	SPM-301-A	2294

7590 04/22/2004

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EXAMINER	
CROSS, LATOYA I	

ART UNIT	PAPER NUMBER
1743	20

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/601,374	HAARER ET AL.	
	Examiner	Art Unit	
	LaToya I. Cross	1743	

-- Th MAILING DATE of this communication appears on th cover she t with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7-11-03 has been entered.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 4-6, 8 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanakkanatt '643 in view of Journal of Physical Chemistry article "Photochromism and Thermochromism driven by Intramolecular Proton Transfer in Dinitrobenzyl pyridine Compounds" authored by Corval et al.

Kanakkanatt '643 dicloses packaging materials containing dyes to be used to indicate possible spoilage and indicate that a package has been exposed to undesirably high or low temperatures (See abstract). At page 2, lines 18-21, Kanakkanatt '643 discloses incorporation of photochromic dyes into polymeric materials (matrix) as recited in claim 1. When the photochromic dye is exposed to specific stimuli, such as UV light, a color change in the dye results. At page 3, lines 9-22, Kanakkanatt '643 discloses using the dyes in packaging materials, as recited in claim 2. At page 5, lines 29-38, the reference teaches that the color change that results may be reversible where the matrix is to be used again. Regarding claims

16-19, Kanakkanatt '632 teaches that the dye materials may be affixed to (as in a substrate) or incorporated into the packaging materials or may be included as a coating (page 6, lines 31-37). With respect to claims 3, 7 and 9, Kanakkanatt '643 provides examples 1-5, wherein indicator dyes are incorporated into polymeric materials and due to the interactions of the substituent group of the dye, a reversible color change forms. These reactions are a result of transferring of different molecules upon contact with UV light. At page 3, lines 17-19, Kanakkanatt '643 teaches that the color change of the photochromic dye may be temporary to denote successful irradiation completion. In example 1 of the reference, a photochromic dye is used as an indicator. Upon exposure to UV light, the indicator changes colors and then returned to the original color (clear). This reversible color change is similar to Applicants' claimed "discoloration following photo-induced coloration".

Kanakkanatt '643 fails to disclose "crystalline" photochromic dyes that respond as a function of time and temperature.

Corval et al teach 2-(2, 4-dinitrobenzyl) pyridine (having the formula of claim 4 and shown in the reference as structure 1) and 2-(2, 4-dinitrobenzyl)- 1, 10-phenanthroline (having the formula of claim 5 and shown in the reference as structure 6). The article teaches that these compounds undergo a photochromic process from a photon transfer reaction. It would have been obvious to one of ordinary skill in the art to use these compounds in the packaging materials of Kanakkanatt '643 due to their unique ability to change visually in response to radiation light. Both the compounds of Corval et al and those disclosed by Kanakkanatt are used as time-temperature indicators. Substitution of one compound for another known for the same use would have been well within the skill of the ordinary artisan. See MPEP 2144.06. In using such compounds, an effective indicator of spoilage in food products can be provided.

Therefore, for the reasons set forth above, Applicants' claimed invention is deemed to be obvious over Kanakkanatt '643 in view of Corval et al.

9. Claims 10, 12-15, 20-22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanakkanatt '643 in view of US Patent 3,999,946 to Patel et al.

The disclosure of Kanakkanatt '643 is given above.

Kanakkanatt '643 does not disclose the additional use of a non-reversible indicator.

Patel et al '946 teach indicator compositions to be used in packaging materials to determine whether perishable items have been exposed to undesirable time – temperature history. Patel et al '946 use indicator dyes whose color change is irreversible, as recited in claim 12. Regarding claims 13 and 14 and 22. Patel et al '946 teach using a filter material with the indicator to eliminate undesirable photo-induced reactions (col. 8, lines 5-8). At col. 12, lines 7-9, Patel et al '946 use a reference chart to compare the resulting color, as in claims 15, 20 and 24.

It would have been obvious to one of ordinary skill in the art to use both a reversible indicator dye and an irreversible indicator dye because use of such would allow instant indication of undesirable time temperature conditions and simultaneously serve as a recording device to show a history of the time temperature conditions.

Response to Arguments

4. Applicant's arguments filed 7-11-03 have been fully considered but they are not persuasive. With respect to the Kanakkanatt reference, Applicants' argue that crystalline indicators that respond to time and temperature are not disclosed. Crystalline indicators, such as those claimed by Applicants are known for their photo-induced coloration abilities. It would

have been obvious to one of ordinary skill in the art to substitute known time-temperature indicators with other compounds useful as time-temperature indicators.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaToya I. Cross whose telephone number is 571-272-1256. The examiner can normally be reached on Monday-Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Jill Warden
Supervisory Patent Examiner
Technology Center 1700